

## CLAIMS

What is claimed is:

1. A method for making a nitride laser diode array structure comprising the steps of:  
  
providing a semiconductor membrane having an insulating substrate attached on a first side of said semiconductor membrane;  
  
attaching a thermally conducting substrate to a second side of said semiconductor membrane;  
  
removing said insulating substrate from said first side of said semiconductor membrane; and  
  
placing a metal layer on said first side of said semiconductor membrane.
2. The method of Claim 1 wherein said insulating substrate is comprised of sapphire.
3. The method of Claim 1 wherein the step of attaching said thermally conducting substrate to said first side of said semiconductor membrane includes putting a solder layer on said thermally conducting substrate.
4. The method of Claim 3 wherein said solder layer includes a material selected from the group consisting of In, PbSn, and AuSn.

5. The method of Claim 1 wherein the step of removing said insulating substrate includes exposing said insulating substrate to laser light.
6. The method of Claim 5 wherein the step of removing said insulating substrate includes polishing a surface of said insulating substrate prior to exposure to laser light of said surface.
- 6  
7. The method of Claim 1 wherein said semiconductor membrane is comprised of In, Ga, Al and N.
- 7  
8. The method of Claim 1 wherein said thermally conducting substrate includes a material selected from the group consisting of silicon, silicon carbide, copper and diamond.

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9. A method for making a nitride laser diode array comprising the steps of:
- providing a semiconductor membrane having a first crystal plane, said semiconductor membrane having an insulating substrate attached to a first side of said semiconductor membrane and having a plurality of electrodes attached to a second side of said semiconductor membrane;
- attaching a thermally conducting substrate having a second crystal plane to said first side of said semiconductor membrane such that said first and said second crystal planes are aligned;
- removing said insulating substrate from said first side of said semiconductor membrane; and
- placing a metal layer on said first side of said semiconductor membrane.

10. The method of Claim 9 further comprising the step of:
- cleaving said thermally conducting substrate along said second crystal plane and cleaving said semiconductor membrane along said first crystal plane to make facets in said laser diode array.

11. The method of Claim 8 wherein said thermally conducting substrate is silicon.

12. The method of Claim 10 wherein said second crystal plane is the {111} plane.

13. A method for making a nitride laser diode array comprising the steps of:

providing a semiconductor membrane having a first crystal plane, said semiconductor membrane having an insulating substrate attached to a first side of said semiconductor membrane and having a plurality of electrodes attached to a second side of said semiconductor membrane;

attaching a thermally conducting substrate having a second crystal plane to said first side of said semiconductor membrane such that said first and said second crystal planes are aligned;

removing said insulating substrate from said first side of said semiconductor membrane;

placing a metal layer on said first side of said semiconductor membrane;

and

etching a trench through said metal layer and said semiconductor membrane, said trench dividing said metal layer and said semiconductor membrane into two separate sections.